

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s) : Per Martinsson, et al.  
Serial No. : 10/608,630  
For : WEAR LEVEL INDICATING FILAMENTS AND FABRICS (AND GUIDELINE APPLICATIONS)  
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Examiner : Andrew T. Piziali  
Group Art Unit : 1794  
Confirmation No. : 8456

DECLARATION OF FRANCIS L. DAVENPORT UNDER 37 C.F.R. §1.132

Commissioner for Patents, P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

I, Francis L. Davenport, declare and state that:

1. I make this statement in connection with U.S. Application Serial No. 10/608,630 ("the '630 application").
2. I am an **Engineer** and an employee of Albany International Corp., the assignee of the '630 application.
3. I received **BS Ch E** degree from **Clarkson University** in **Potsdam, NY**. I have been employed by the assignee of this application, since 1974. In view of my education and experience, I consider myself to be an expert in the field to which this application pertains.

4. I am familiar with the prosecution history of the '630 application, up to and including the Notice of Panel Decision mailed on October 9, 2008.
5. Claims 1, 3, 5, 7-12, 14-15, 17, 19, 21-26, and 28-48 are pending in the application; claims 5, 7-12, 19, 21-26, and 29-47 are withdrawn. Claims 1, 3, 14, 15, 17, 28, and 48 are rejected under 35 U.S.C. §103(a) over U.S. Patent No. 4,093,512 to Fleischer ("Fleischer") in view of U.S. Patent No. 3,800,019 to Parsey ("Parsey") or U.S. Patent No. 6,653,943 to Lamb ("Lamb"). Claims 1, 3, 14-15, 17, 28 and 48 have been rejected under 35 U.S.C. §103(a) over Fleischer in view of "Applicant's Disclosure" and Parsey or Lamb.
6. Claims 1, 3, 14, 15, 17, 28 and 48 were rejected under 35 U.S.C. § 103(a) over U.S. Patent No. 4,093,512 to Fleischer (hereinafter merely "Fleischer") in view of any one of U.S. Patent No. 3,800,019 to Parsey ("Parsey") or U.S. Patent No. 6,653,943 to Lamb ("Lamb").
7. Independent claims 1 recites: "A papermaking fabric multilayer monofilament, said multilayer monofilament having a core and a sheath comprising a plurality of respective layers visibly distinguishable from one another and the core by their contrasting color, or reflectivity for indicating a level of wear of a papermaking fabric comprised thereof, wherein said multilayer monofilament is formed before being used in said papermaking fabric." (Emphasis added).
8. Independent claims 15 and 48 each recite: "one or more multilayer [mono]filaments each having a core [and a sheath] [comprising/comprised of a monofilament yarn surrounded by] a plurality of respective layers visibly distinguishable from one another and the core by their contrasting color, or reflectivity for indicating a level of wear, wherein said multilayer monofilament is formed before being used in said endless industrial fabric."
9. The claims recite a multilayer monofilament for use in a papermaking fabric. The multilayer monofilament is formed of a core and a plurality of layers that are distinguishable from each other and the core. The multilayer monofilament, as recited in the instant claims, takes its final form before being used in a papermaker's fabric.

10. For example, FIG. 4 of the Instant Application is a plan view of an unused fabric 20 (wear side) comprising at least some of the multilayered filaments 10, according to the teachings of the present invention. Fabric 20 can be a structure woven from yarns 10 lying in the cross-machine direction (CD) and yarns 22 lying in the machine direction (MD), although it need not be woven to fall within the scope of the present invention, and could be a nonwoven structure. In FIG. 4, CD yarns 10 which are multilayered filaments of the variety shown in FIGS. 1, 2 and 3 are depicted as weaving with MD yarns 22 in a plain weave. In the example shown, the knuckles 24 on the surface of the fabric 20 are most susceptible to wear because they are formed where a yarn in one direction of the fabric 20 passes or crosses over one in the other direction, and are therefore elevated points on the surface of the fabric 20.
11. After the fabric 20 has been used for some period of time, the same plan view of the fabric 20 will appear as shown in FIG. 5. At least one or more of the outer layers 16, 18 of the CD multilayered filaments 10 are shown to be worn away to the point where an inner layer 14 or the core 12 is exposed to view. By virtue of its different color or reflectivity, for example, compared to that of the outer layers 16, 18, the inner layer 14 or core 12 gives an indication of the level of wear of the fabric 20: *Instant Application*, paragraphs [0027] and [0028].
12. Because these fabrics have a limited lifespan and require regular replacement, there needs to be a means to indicate the wear level in the fabric, so that the fabric can be replaced in time, avoiding any catastrophic failure and loss, damage or shutting down of the machines. Moreover, because these industrial fabrics have a width of from 5 to over 33 feet, a length of from 40 to over 400 feet and weigh from approximately 100 to over 3,000 pounds, replacement of these fabrics often involves taking the machine out of service, removing the worn fabric, setting up to install a fabric and installing the new fabric. And because these fabrics are typically made to order, it is important to know the condition of the fabric being currently used on the paper machine. In the instant invention the individual monofilament yarn comprises the core and is surrounded by a plurality of respective layers. See *Instant Application*, page 6, lines 3-17. These plurality of

layers, which can be dyes as recited in the specification, act as level indicators for wear of the industrial fabric e.g. a green color used as an outermost coating of the filament will indicate a healthy fabric, and a red color used as an innermost coating of the core filament would call for a replacement.

13. As to Fleischer, although it discloses that its load bearing elements can be monofilaments (col. 3, lines 27-56), there is no further discussion regarding the structure of this monofilament in the rest of Fleischer's disclosure. The only yarn structure that Fleischer later discloses in col. 4 is coated using a two step resin treatment by first applying a thermosetting acrylic resin and then a phenolic resin (col. 4, lines 37-50). However, an ordinarily skilled artisan would understand that the coating method suggested for applying the resin in Fleischer is that as described in Christie et al, U.S. Patent Nos. 3,252,821 and 3,149,003, both of which teach **coating the fabric itself and not the monofilament**. *Fleisher* at col.4 line 53- col. 5, line 6. While coating the fabric might cover one side of the monofilaments, the knuckles of the fabric where the warp and weft intersect, are certainly not going to have the same multilayer coated structure; nor, most importantly, is there assurance of uniformity. Accordingly, the cited reference fails to disclose or predict the use of monofilaments that are first coated and then used to make the fabric.
14. Nonetheless, the Final Office Action dated May 28, 2008 ("Final Office Action") alleges that coating the monofilaments before forming the fabric renders the article identical, or only slightly different from Fleischer's fabric. This is in error.
15. Fleischer's two step resin treatment coating the fabric itself, unlike the claimed monofilament coated before forming the fabric, would result in a fundamentally different product with respect to indicating a level of wear. Fleischer's post-fabric coatings could fail to, inter alia, (a) cover the whole monofilament (hence failing to layer or sheath it) and (b) non-uniformly coat the filaments at the knuckles where warp and weft intersect. In actual use either or both of the lack of coverage and irregularity of the applied coatings make them ill-suited to be adapted to detect wear via any visual distinction between the respective layers and the core, and in fact doing so would likely confuse, rather than aid, detection of a level of wear.

16. Moreover, Fleischer's objective is to produce a papermakers' belt with ultra high modulus load bearing yarns such that the belt has improved stretch resistance. Fleischer attempts to achieve an improvement in tensile strength and stretch resistance of forming fabrics woven from multifilaments by employing high tenacity materials. *Fleischer*, col. 4 line 53- col. 5, line 6. Those of ordinary skill in the art, however, know that materials like Kevlar have very poor abrasion resistance when used in papermaking fabrics, and therefore in order to survive, these materials must be wrapped and/or coated.
17. One objective of the above-claimed invention, contrariwise, is to give the papermaker an idea of how and to what levels the wear or at what rate the wear is occurring before catastrophic failure occurs. If the coating on the Kevlar yarn of Fleischer is gone, the fabric is in imminent failure mode, therefore providing for all or nothing. On the other hand, with the claimed invention the papermaker is alerted to, in advance, the state of the papermaking fabric with the plurality of layers indicating a level of fabric wear, such that the papermaker could replace it with a new fabric in case of a worn out state, thus avoiding a catastrophic failure and subsequent repair/losses. As a result, an ordinarily skilled artisan would have no reason to adapt Fleischer's coated filaments with contrasting color or reflectivity as this would provide no effective warning at all.
18. Further, despite the fact that Fleischer states that its yarn can be of multifilament or monofilament form, an ordinarily skilled artisan would appreciate that at present no such material exists in monofilament form with the modulus specified that can be used in paper machine clothing that also has the other required characteristics (flexibility, abrasion resistance etc.). The only materials that exist are multifilaments such as the aramids Fleisher expressly teaches, which is to be expected as they cannot be made into monofilament form. Quite simply, no such "Ultramono" exists for the claimed invention. And again, if Fleisher's coating or wrapping wears away, the aramids have such poor abrasion resistance that they will catastrophically fail.

19. An ordinarily skilled artisan would not turn to the Parsey or Lamb to cure the deficiencies of Fleischer as the rope structures of Parsey and Lamb are not similar or analogous to the claimed invention.
20. Parsey teaches a rope structure constructed from a core of at least one bundle of filaments, wherein the core may be bound by a steel tape or wire or sheathed with two organic coatings of different colors. In these configurations, damage or wear to the rope can be detected by measuring the resistance between the steel binding means or by a change in the color on the outside of the rope. See *Parsey* at col. 1, line 39 - col. 2, line 29. As used in Parsey, a bundle is used "to denote a group of filaments arranged in parallel fashion. Such a group may be assembled by combining together without twisting a number of filamentary yarns to produce the larger bundle required for a rope core." *Parsey*, col. 3, lines 50-55. Therefore, Parsey teaches a bundle or plurality of filaments that are sheathed, not a core comprised of a single yarn that is surrounded by a plurality of respective layers.
21. Lamb is directed to suspension ropes having polyurethane sheaths as used, for example, in an elevator assembly. *Parsey*, Col. 2, lines 26-28. As depicted in Figure 1a, the suspension or wire rope 4 is constructed from a wire rope that includes a plurality of lead supporting wire members or strands. *Lamb*, col. 3, lines 16-20. In various embodiments, the wire rope in its entirety (which includes the plurality of wires or strands) is encased in sheaths of materials having differing properties where the properties of the sheath material are used to detect an amount or wear on the suspension rope. Therefore, Lamb teaches a plurality of wire members or strands that are sheathed, whereas the instant invention teaches a core comprised of a single yarn that is surrounded by a plurality of respective layers.
22. The structures and uses of Lamb and Parsey's rope structures are not similar or analogous to those of the claims, and an ordinarily skilled artisan would not turn to them for solutions.
23. The claims recite a multilayer filament having a core comprised of a single yarn surrounded by a plurality of respective layers that are used to indicate the level of wear of an industrial fabric constructed therefrom. Parsey, in contrast, is directed to a rope structure constructed from a core of at least one bundle of filaments, wherein

the core may be bound by a steel tape or wire or sheathed with two organic coatings of different colors. Lamb, in contrast, is directed to suspension ropes having polyurethane sheaths as used, for example, in an elevator assembly. Neither Parsey nor Lamb are within the field of an ordinarily skilled artisan's endeavor. Parsey relates to rope structures and Lamb relates to suspension ropes

24. Secondly, Parsey and Lamb are not reasonably pertinent to the particular problem with which the instant inventors were involved. As previously stated, Parsey relates to rope structures and Lamb relates suspension ropes. In contrast, the instant invention is directed to problems associated with wear of an industrial fabric, which is subject to wholly different kinds of stresses and wear, explained above, than those for ropes. Moreover, it is not a further product made from these ropes that needs wear detection, and indeed, these ropes are not woven or formed into another product at all. They are not yarns. It is clear that the matters with which Parsey and Lamb are concerned would not logically have commended themselves to an ordinarily skilled artisan's attention in considering any problem, including the problem to be solved by the instant invention.
25. The claimed structures are quite different than those of Lamb and Parsey. The claims are directed to filaments that are used to detect wear in an industrial fabric. In contrast, neither Parsey nor Lamb perform a function similar to detecting wear of an industrial fabric. Instead Parsey relates to detecting wear of rope structures comprised of bundles of filaments and Lamb relates to detecting wear of suspension ropes for use in, for example, elevator assemblies.
26. The Final Office Action denies that Parsey and Lamb are non-analogous art, despite the fact that each relates to rope structures, in particular marine water cordage and elevator suspension ropes, and neither of them teach or suggest use of a monofilament. One of ordinary skill in the papermaking art would not look to rope-making generally, or into elevator suspension ropes or marine water cordages specifically, to come up with a solution for wear in papermaking fabrics. A papermaking fabric is not similar to a rope.
27. At page 3, the Final Office Action states Parsey (at Col. 2, lines 8-29) and Lamb (at Col. 4, lines 20-35), "each disclose that it is known in the wear detecting art that a

core may be surrounded by a plurality of outer layers of different colors to indicate degree of wear." Of course, neither of these references refer to nor even imply a "wear detecting art," because there is no such thing. To the contrary, Parsey and Lamb are concerned with rope-making, and not industrial fabrics, and far less so papermaking fabrics (e.g., belts for papermaking machines). In particular, the references disclose sheathing (and re-sheathing) a rope to detect wear of a rope, not a yarn, and certainly not a monofilament. Thus the manner in which wear is detected on a sheathed rope is wholly different than the manner in which it is detected by the claimed yarns allow for wear detection of an industrial fabric. An ordinarily skilled artisan simply would not look to ropes – be they for elevators or marine cordage – as a material to make papermaking fabrics out of, or to seek solutions for problems associated with papermaking fabrics.

28. At page 5, the Final Office Action employs hindsight reasoning to supply a reason for its application of Fleischer, noting that "Applicant discloses that a means for monitoring wear on a papermaker's fabric, and particularly at any point on its inner and outer surfaces, even when the paper machine is operating, would be very helpful to those in the papermaking industry." No one denies that the claimed invention is very helpful to those in the papermaking industry. But, the Specification also explained that "[n]ormally, wear is monitored using a thickness gauge. However, it is difficult to measure the thickness of a papermaker's fabric more than a foot or two in from its edges with such a gauge...." The Specification simply shows that the Applicant identified and provided a solution to the long-felt need of monitoring-wear that was inadequately met by prior art gauges. If anything, the prior art shows that the approaches taken before that disclosed were of a difference character (gauges).
29. For the reasons given above, an ordinarily skilled artisan would not consider that Fleischer, Parsey, Lamb, nor anything the Applicants' own disclosure, alone or in combination, disclose or render obvious the above-recited limitations of independent claims 1, 15 and 48.
30. All statements made herein of my own knowledge are true and all statements made on information and belief are believed to be true. These statements were made with

the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. § 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Date:

3 February 2009

Jonathan Davenport  
NAME